Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الهيئـــة الوطنيـــة للتقويــم
والاعــتــمــاد الأكــاديـمـــي

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications
(CS)

Probability and   Statistics
STAT 320

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Course Specifications

Institution	College of Science	Date of Report	8/5/1434
College/Department	Mathematics Department		

A. Course Identification and General Information

1. Course title and code: : Introduction to Probability and Statistics - STA 224
2. Credit hours   3 Hours
3. Program(s) in which the course is offered. Computer science and information systems (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course   M.EL-Shahat EL-Saadani
5. Level/year at which this course is offered   The sixth level
6. Pre-requisites for this course (if any) Calculus2   Math 220
7. Co-requisites for this course (if any)
8. Location if not on main campus   Main Campus , Zulfi city

9. Mode of Instruction (mark all that apply)

a. Traditional classroom		What percentage?	
b. Blended (traditional and online)		What percentage?	70
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	30

Comments:

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B Objectives

1. What is the main purpose for this course?
1. Have the basic statistical methodology of data analysis including; graphs, descriptive statistics
2. Understand and describe sample spaces and events for random experiments with graphs, tables, lists, or tree diagrams
3. Calculate the probabilities of joint events such as unions and intersections from the probabilities of individual events
4. Studying and calculate the conditional probabilities of events
5. Determine the independence of events and use independence to calculate probabilities
6. Use Bayes' theorem to calculate conditional probabilities
7. Understand random variables and its distributions
8. Studying the Expected value of the random variable
9. Have Some special probability distributions -The Normal distribution.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1-Cooprate with other educational institutions to find how they deal with the subject.

2- Re- new the course references frequently.

3-Frequently check the latest discovery in science to improve the course objectives.

4- The course needs the use of computers.

5- Posting some course material on the websites to help the students.

6- Focusing on generic skills.

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C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Topics to be cover											

List of Topic	No. of Weeks	Contact hours				Total of contact	Self- Study			Discussions	total
		Lecture	tutorials	Lab	Office Hours		Internet	Library	Homework		
Introduction and overview of statistics - Organization and presentation of statistical data - Measures of central tendency (Mean, Median, Mode, …) of the simple data and the frequency distribution	2	4	2		1	7	1	3	4	2	**17**
Measures of dispersion (The Range – The Variance and the standard deviation - Coefficient of variation of the simple data and the frequency distribution	3	6	3		1	10	1	5	6	4	**26**
Mid-term 1		1				1					**1**
Sample space and Events - Counting Techniques (Fundamental basics, Addition Rule – Multiplication Rule- Permutation and Combinations)	3	6	3		1	10	1	5	6	4	**26**
Definition of the probability and its applications Conditional probability - Independence of events and Bayes theorem and its applications	2	4	2		1	7	1	3	4	2	**17**
Mid-term 2		1				1					**1**
Definition of the random variable- The probability function (The probability Distribution, Expected value	3	6	3		1	10	1	5	6	4	**26**
Some special probability distributions - The Normal distribution.	2	4	2		1	7	1	3	4	2	**17**
Mid-term 3		1				1					**1**
Final Exam		2				2					**2**
Total											**134**
Note: one credit hour is equal 25 – 30 load work hour											

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2. Course components (total contact hours and credits per semester):							
Credit	Contact Hours				Self-Study	Other	Total
	Lecture	Tutorial	Laboratory	Practical			
3	30	15			78	11	134

2. Additional private study/learning hours expected for students per week.	3 Hours

3. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define statistics, population and sample. Introduce basic statistical methodology of data analysis including; graphs, descriptive statistics. List the addition and the multiplication rules of probability	**Start** each chapter by general idea and the benefit of it. **Demonstrate** the course information and principles through lectures.	Exams Midterms Final examination.
1.2	**Outline** the logical thinking. The importance of counting methods in probability theory	**Provide** main ways to deal with the exercises.	Home work.
	State the purpose of the random variable.	**Solve** some examples during the lecture.	Continuous discussions with the students during the lectures.
2.0	**Cognitive Skills**		
2.1	The students will **explain and interpret** the counting rules . Find statistical problem, data analysis and interpret the results The students will estimate the population parameter by the statistic	**Encourage** the student to look for some complicated problems in the different references.	Midterm exams Quizzes.
2.2	Describe basic concepts of data analysis (discrete and continuous). Interpret the sum deviations of data about its mean equal zero Find statistical problem, data analysis and interpret the results	**Ask** the student to attend lectures for practice solving problem.	Doing homework. Check the problems solution.
	Student's ability to **write** the conditional probability rule and bayes theorem. Draw the tree diagram and prepare the sample space .	Homework assignments.	Discussion of how to simplify or analyses some problems using tree diagram
3.0	**Interpersonal Skills & Responsibility**		
3.1	The student should **illustrate** how take up	Ask the students to search	Quizzes of some previous

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	responsibility.	the internet and use the library. Encourage them how to attend lectures regularly by assigning marks for attendance.	lectures. Ask the absent students about last lecture.
3.2	Must be **shown** the ability of working independently and with groups.	Teach them how to cover missed lectures. Give students tasks of duties	Discussion during the lecture.
4.0	**Communication, Information Technology, Numerical**		
4.1	The student should **illustrate** how to communicating with: Peers, Lecturers and Community.	Creating working groups with peers to collectively prepare: solving problems and search the internet for some topics.	Discussing a group work sheets.
4.2	The student should **interpret** how to Know the basic statistical principles using the internet.	Give the students tasks to measure their: mathematical skills, computational analysis and problem solving.	Discuses with them the results of computations analysis and problem solutions.
	The student should **appraise** how to Use the computer skills and library.	Encourage the student to ask for help if needed.	Give homework's to know how the student understands the numerical skills.
	The student should **illustrate** how to Search the internet and using software programs to deal with problems.	Encourage the student to ask good question to help solve the problem.	Give them comments on some resulting numbers.
5.0	**Psychomotor**		
5.1	Not applicable	Not applicable	Not applicable
5.2	Not applicable	Not applicable	Not applicable

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict,

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	justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested **_verbs not to use_** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

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Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Midterm 1	5th week	15 %
2	Midterm 2	10th week	15%
3	Midterm 3	15th week	15%
4	Homework + reports + Quizzes	During the semester	15%
5	Final exam	End of semester	40 %

5. Schedule of Assessment Tasks for Students During the Semester

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

1- 6-office hours per week in the lecturer schedule.

2- The contact with students by e-mail and website.

E. Learning Resources

1. Required Text(s)

Probability & statistics for engineers & scientists. Ronald E. Walpole . . . [et al.]. Prentice Hall. 2012 — 9th ed. ISBN 978-0-321-62911-1

2. Essential References

1) Applied Statistics and Probability for Engineers. D.C. Montgomery & G. C. Runger. John Wiley & Sons. 2003.

2) Introductory Statistics. Wonnacott, T. H., and Wonnacott, R. J. John Wiley & Sons. 1969

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3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List):

Same as mention above.

4-.Electronic Materials, Web Sites etc

http://ocw.mit.edu/courses/electrical   engineering-and-computer-science/6-041sc-probabilistic-systems-analysis-and-applied-probability-fall-2013/unit-i/quiz-1/

http://faculty.mu.edu.sa/m.alsaadani/MCQ

5- Other learning material such as computer-based programs/CD, professional standards/regulations: None

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Lecture rooms, laboratories, etc.)

-Classroom with capacity of 30-students.

- Library.

2. Computing resources: Not available

3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list):   None

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching: Student evaluation electronically organized by the University.

2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

The colleagues who teach the same course discuss together to evaluate their teaching.

3 Processes for Improvement of Teaching

- Course report, Program report and Program self-study.

-   A tutorial lecture must be added to this course.

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4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

The instructors of the course are checking together and put a unique process of evaluation.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

1-The following points may help to get the course effectiveness:

* Student evaluation.

* Course report.

* Program report.

* Program self-study.

2- According to point 1 the plan of improvement should be given

Faculty or Teaching Staff: Mohammed EL-Shahat Mahmoud EL-Saadani

Signature: **Date Report Completed:** _____

Received by: _____   **Dean/Department Head**

Signature: _____   **Date:** _____